

# ABSTRACT

5 A probe card assembly includes a probe card, a space  
transformer having resilient contact structures (probe elements)  
mounted directly <sup>thereto</sup> ~~to~~ (i.e., without the need for additional  
connecting wires or the like) and extending from terminals on  
a surface thereof, and an interposer disposed between the space  
transformer and the probe card. The space transformer and  
interposer are "stacked up" so that the orientation of the space  
transformer, hence the orientation of the tips of the probe  
10 elements, can be adjusted without changing the orientation of  
the probe card. Suitable mechanisms for adjusting the  
orientation of the space transformer, and for determining what  
adjustments to make, are disclosed. The interposer has  
resilient contact structures extending from both the top and  
15 bottom surfaces thereof, and ensures that electrical connections  
are maintained between the space transformer and the probe card  
throughout the space transformer's range of adjustment, by  
virtue of the interposer's inherent compliance. Multiple die  
sites on a semiconductor wafer are readily probed using the  
disclosed techniques, and the probe elements can be arranged to  
20 optimize probing of an entire wafer. Composite interconnection  
elements having a relatively soft core overcoated by a  
relatively hard shell, as the resilient contact structures are  
described.